NEWSLETTER

January 1979

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FIRE BLIGHT

FEUERBRAND

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INTERNATIONAL WORKING GROUP

ON FIRE BLIGHT RESEARCH

International Working Group on Fire Blight Research

N E W S L E T T E R

Plant Protection Commission

International Society for Horticultural Science

in cooperation with

U.S. Apple and Pear Disease Workers

and

European & Mediterranean Plant Protection Organization

January 1979

UNITED STATES DEPARTMENT OF AGRICULTURE
Science & Education Administration
Agricultural Research Center
Beltsville, Maryland

Dr. Harry L. Keil

1915 — 1978

Letter from the Editor

It is a great pleasure to send to all persons interested in fire blight this combined package of USDA Handbook No. 510 and the Additional Bibliography with the first International Newsletter on Fire Blight Research. With your permission, I dedicated this first issue of the newsletter to my close friend and research colleague, Dr. Harry L. Keil, who passed away unexpectedly from a heart attack on August 24, 1978.

There are a total of 190 names on the list of interested persons living in 32 countries around the world. Of these countries, 19 have never reported any occurrence of fire blight. However, a total of 23 countries have one or more contact persons for the newsletter. Of the 39 contact persons in total, 50% returned the questionnaire, which included nearly all of the countries with fire blight. If someone would like to serve as an additional contact person in some of the larger countries or as a new contact in countries with a vacancy or those not yet listed, please let me know on the enclosed questionnaire blank.

Nearly all the names of the persons actively engaged in fire blight research (category 1) on the address list and many of those indirectly interested in fire blight (category 2) are also listed in the Table entitled "Survey of Fire Blight Research in the United States, Canada, and Europe". For this first newsletter, I made an effort to include all persons in category 1 in the United States and Canada in this survey. However, this was not possible for some of the researchers in Europe. Now that we are all united by way of a newsletter, and combined with everyone's effort, this survey table should be kept up to date for the benefit of all of us. Therefore, I hereby suggest that everyone receiving this newsletter to please take the time to 1) check your name, address, telephone number, and fire blight interest on the mailing list, and 2) to examine all the entries on the survey table. Please make all necessary corrections, deletions and additions on the two blank sheets provided for your assistance in the back of this newsletter and mail them to your contact person or directly to me. This, in turn, will simplify updating the survey table for future issues of the newsletter.

The 1238 literature citations in the Fire Blight Handbook plus 890 in the Additional Bibliography equal the complete card and reprint collection in my laboratory as of December 1978. The 14 headings represent the total subject card index, while the first 13 headings include all the American literature. These headings are identified with a roman number and/or letter system and each reprint is then numbered accordingly in chronological order. If anyone is interested in a specific article listed in the Additional Bibliography and is unable to find it in his local library, please send me only the complete number (I-A-45, III-150, IX-226, or XII-L-56, etc.) and I will try to return a xerox copy of the article or abstract to you. Similarly, articles in the Handbook can be identified simply by their citation number. In return, I like to ask that if anyone

knows of a fire blight publication (especially recent ones) not listed in the handbook or bibliography, to please take the time and send me the information plus a possible reprint in order to complete our collection and to keep everyone on the list informed in the future. Individual articles printed in recent symposium proceedings, such as Acta Horticulturae No. 86 (June 1978) and the EPPO Colloquium held in Wageningen (November 1977), are listed separately by subject heading in the Additional Bibliography.

The real success and effectiveness of our international working group on fire blight research will depend on the total cooperation of all its members. I wish all of you a very healthy and successful New Year without any new or serious outbreaks of fire blight in your region or country.

Tom van der Zwet

Tom van der Zwet
Research Plant Pathologist

Present Status and New Occurrences of Fire Blight

France

1978, in France, has been a year with very high fire blight activity (see map).

1. Dunkerque area

In this area, contamination by E. amylovora has been known since 1972. The eradication program has been stopped in 1977. In 1978 we had important spread of the disease, out of the previously know limits of the focus (20 km Eastward and Southward). The only diseased host plants are hawthorns (Crateagus sp.).

2. Southwest area

Two new outbreaks of fire blight were discovered in July and August:

a. near DAX (departement des Landes)

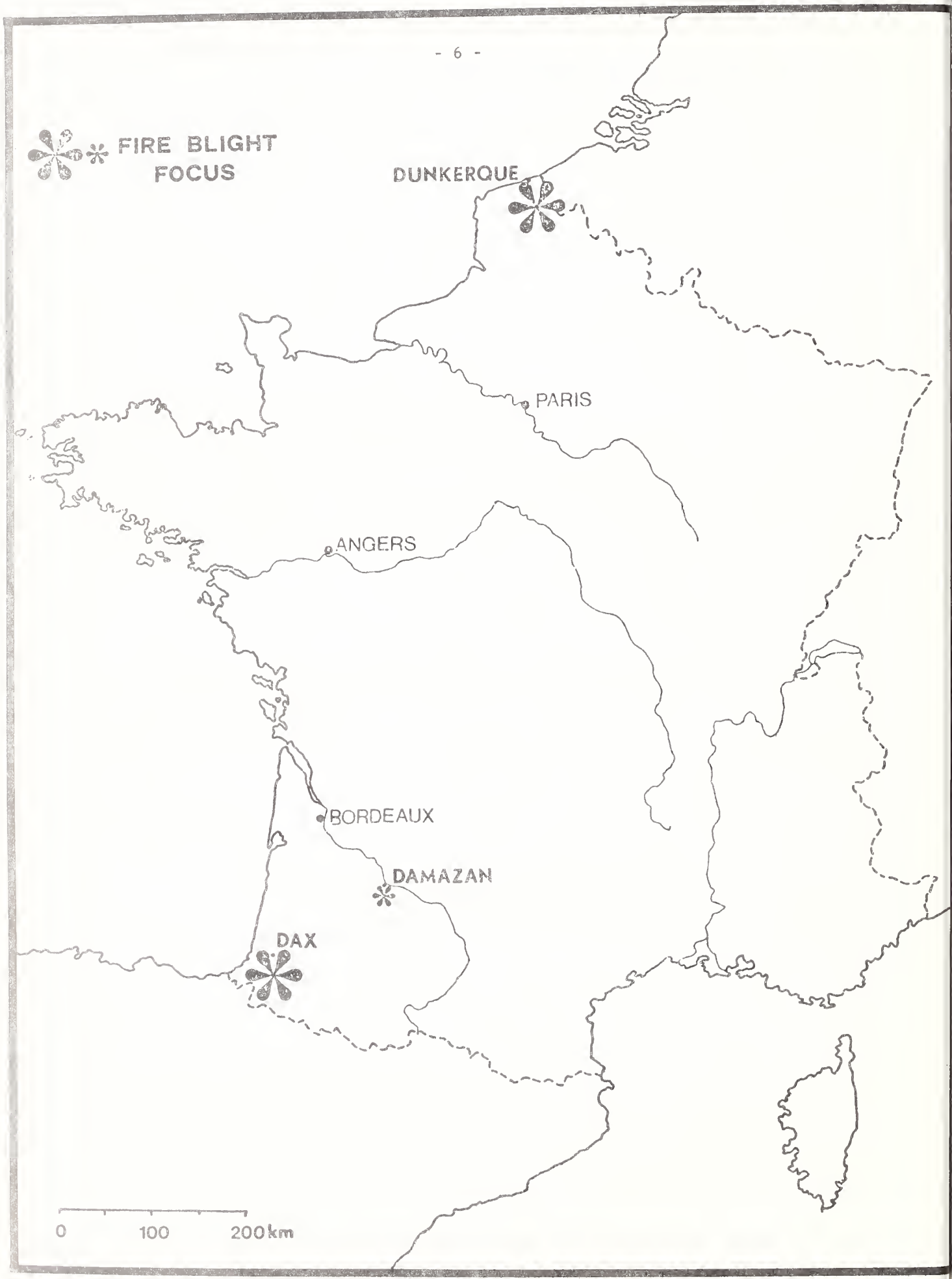
In this small pear and apple production area a severe attack on fire blight was discovered in a 15 year-old pear orchard. A survey in the surrounding area showed that 38 pear orchards (65 ha) were contaminated. In two different orchards all the trees were damaged, some of them down to the trunk (10 to 20% of the trees). The longest distance between two diseased orchard is about 30 km.

b. near DAMAZAN (departement de Lot et Garonne)

One infested pear orchard was discovered in early August. Subsequently 14 orchards (about 25 ha) were found with fire blight in the immediate surroundings (within 5 km from the first discovered orchard). The contamination is high (20% at the maximum, no dead tree). This outbreak is 150 km east from DAX, and situated in a very important pear and apple production area (1500 and 2500 ha, respectively).

c. eradication

The destruction of diseased orchards is scheduled in early 1979. The "DAX" outbreak is rather widespread and it is likely an old one (3-4 years). The destruction of blighted orchard will probably not remove the disease, but will lessen the inoculum level. In the DAMAZAN area the disease seems to be of more recent origin, and it is concentrated in a restricted area (a survey in the whole Garonne valley gave negative results). The destruction of orchards with fire blight is hoped to be efficient to remove the disease from this area.


FIRE BLIGHT FOCUS
DUNKERQUE
PARIS
ANGERS
BORDEAUX
DAMAZAN
DAX
0
100
200 km

In these southwest outbreaks, fire blight has been found only on pear trees, never on apple or onamentals, though apple orchards are sometimes very near a severely diseased pear orchard. A survey in nurseries gave negative results.

The pear varieties cultivated in these areas are: Passe-Crassane (mainly), Alexandrine Douillard, Doyenne du Comice, Dr. Jules Guyot, Beurre Hardy, Morettini, and Epine du Mas. All but the two last ones were attacked, particularly Passe Crassane. It is important to note that this year and last year secondary blossoms (up to early October) has been very prominent on Passe Crassane.

Up to now no precise assessment of climatic data has been achieved but the climate in the southwest of France is known to be rather hot and wet in spring and summer.

J. P. Paulin
Angers

The Netherlands

Fire blight in the Netherlands was responsible for a great deal of damage to city parks and private gardens during 1978 as well as to pear orchards. Most infections were again found in the broad leaved Cotoneasters (C. salicifolius and C. watereri and their cultivars), although, compared to preceding years, considerable more damage was found in pear orchards. Until October 1978 infections were found in a number of orchards, varying from one to more than 100 infected pear trees per orchard. Due to the severity of infection in one orchard three rows had to be removed and in another 2 ha had to be destroyed. Infection in a number of pear trees dated back to secondary blossom infection in the second half of 1977. The infection was (apparently) not recognized in time by the growers and, due to inadequate precaution, was very likely responsible for secondary spread later in the pruning period as well as in the following spring. This has given rise to a focus in pear orchards in the central part of the country. In the southwest part of the Netherlands, however, the circumstances for infection in 1978 were apparently favorable towards the end of the blossoming period of late flowering pears. This situation, which is very unusual for our country, gave rise to a second focus in pear orchards in that part of the country.

C. A. R. Meijneke
Wageningen

West Germany

The distribution of fireblight in the Federal Republic of Germany has been restricted in the northern federal countries Schleswig-Holstein, Hamburg, Niedersachsen und Bremen in 1978. A further spread to new locations has not occurred. Heavy infections were detected particularly in hawthorn bushes. Moreover, sporadic occurrences on pears and ornamentals of the genus Cotoneaster watereri and C. salicifolius floccosus, weak infections on C. hybr. pendulus and C. dammeri "Skogsholm" as well as on Pyracantha

crenatoserrata "Orange Glow" (area Weser-Ems/Niedersachsen). Restricted cultivation of the highly susceptible Cotoneaster species and hybrids of C. watereri and C. salicifolius in past years might explain the low fire blight incidence. All registered foci were totally eradicated.

W. Zeller
Heikendorf

Denmark

Outbreaks of fire blight observed in Denmark in 1978 were confined to previously known fire blight localities. In these areas, the disease has been more severe this year than in recent years. The disease has been recorded on pear, Cotoneaster sal. floccosus, C. watereri "Braendkjaer", C. harrovianus, Pyracantha sp. and Stranvaesia davidiana.

Weather in 1978

While June and September were unusually wet months, May and August were drier than average. Apart from May, rain fell on more days in June-September inclusive than is normal. July, August and September were cooler and more overcast than average.

J. Hockenhull
Copenhagen

England

Apple blossom blight was seen on late flowering cultivars in several areas in southwest England where fire blight has been rare or absent in earlier years. Elsewhere there were sporadic cases only, mostly on ornamental hosts. Weather was unusually warm for a week in late May and early June throughout southern England but Billing's system for the assessment of the potential for fire blight activity suggested that in May and early June temperatures and rainfall together were more favorable for fire blight in the southwest than elsewhere.

E. Billing
East Malling

Sweden

No fire blight has appeared in Sweden.

K. Olsson
Fack Solna

Ireland

Fire blight has never been recorded in Ireland.

P. Walsh
Dublin

Norway

Up to now fire blight has not been observed in Norway. If the disease should be brought into the country for example with imported nursery products, one fears that the climatic conditions will not be an obstacle to its establishment in certain areas. Consequently importation of the chief host plants of fire blight, from countries considered to be contaminated by the disease, is prohibited.

H. Roed
AS-NLH

Italy

"Fire blight" is not present in our area (Emilia region - Po valley) and we have not received any positive information from the other parts of Italy.

C. Bazzi
Bologna

Greece

The disease has not been recorded in Greece. A survey was carried out in spring-summer of last year in all fruit growing areas of Greece.

P. G. Psallidas
Athens

New York

Fire blight was not generally extensive or severe in New York in 1978. Conditions during the unusually late bloom period were generally hot and dry and little blossom infection was noted. In tests done at Geneva, that involved artificial inoculation of apple blossoms with Erwinia amylovora, less infection developed than expected, due presumably to less than favorable weather conditions. Several apple orchards in the Champlain Valley (extreme northeast section of the state) sustained moderate to severe fire blight damage late in the season, following hail storms.

S. V. Beer
Ithaca, NY

Michigan

Fire blight was sporadic in various fruit areas in the state. Generally, it was more severe on susceptible apple varieties, especially Jonathan and Ida Red.

E. J. Klos
East Lansing, MI

Illinois

Blight incidence rated considerably across Illinois in 1978. Outbreaks of moderate to severe intensity in the central region were common but only trace to light infestations occurred in the south. Regional difference appeared to occur primarily because of rainfall patterns. The south was very dry throughout the spring while the central area recorded near normal precipitation. The northern third of the state received above normal precipation, but experienced little blight. Possible explanations for reduced severity in this region may include the harsh winter and smaller plantings of blight susceptible cultivars.

S. M. Ries
Urbana, IL

California

The fire blight monitoring and warning system continues to produce positive results for efficient and effective blight control in the Central Valley pear orchards. It is based mainly on mean temperatures during bloom exceeding a line from 62°F (15.5°C) on March 1 to 58°F (14.5°C) on May 1.

W. J. Moller
Davis, CA

Oregon

Severe outbreak of fire blight has occurred on pear trees the past two years particularly on Comice, Bosc and Anjou trees which are usually free from the infection. The lack of frost during bloom and high mean temperatures of 60°F (15°C) during bloom apparently encouraged blight infection. Pear growers have been using copper and streptomycin for protection but the most vital part of the production of pears remains to be a well-trained blight cutting crew for year around inspection and control. No streptomycin resistant blight has been isolated yet in southern Oregon.

P. B. Lombard
Medford, OR

Washington

1. Fire blight was severe in most of the areas where pear bloomed during warm weather.

2. Fire blight was severe late in the season in the Columbia Basin. This is probably due to the high migration rate of sucking insects from adjoining alfalfa fields.

3. Fire blight was only a problem on pear.

4. Streptomycin resistance was found for the first time in the Columbia Basin.

R. P. Covey
Wenatchee, WA

Pennsylvania

Fireblight incidence was minor in southcentral Pennsylvania in 1978, but did occur in a few orchards.

K. D. Hickey
Biglerville, PA

Colorado

Very little fire blight in western Colorado commercial Bartlett pear or Jonathan apple orchards in 1977 or 1978. (Summers of '77 & '78 have been very dry, below normal precipitation).

Around Denver & Colorado Springs, blight in ornamental crabapples was of average incidence (5-10% of population) in 1978. Fire blight was severe on ornamentals in 1976 and 1977.

N. S. Luepschen
Grand Junction, CO

Virginia

The fire blight problem as a whole, was only minor during the 1978 growing season. Some local pockets of fire blight were destructive following hail damage to trees.

On May 30, 1977, at 9:00 PM, a destructive hailstorm hit my experimental orchard at Blacksburg, Virginia. Through my own neglect and oversight of not spraying within 24-48 hrs after the storm with streptomycin, E. amylovora became established in the trunks of several trees. Thus, I am still paying for a careless delay.

C. R. Drake
Blacksburg, VA

Ontario

Fire blight has been relatively mild this year in most areas of Ontario except for the extreme southwestern portion of the province in the Harrow area where warm temperatures and adequate rainfall on a weekly basis to the

beginning of July contributed to a severe disease epiphytotic in apples and pears. For the most part fire blight was limited to shoot blight however, late blooming pears and apples did have a moderate amount of blossom blight for the first time in about 10-15 years. There was a moderate amount of fire blight in 1977 and many cankers overwintered with viable bacteria into the spring season.

W. G. Bonn
Harrow, Ontario

Nova Scotia

Only a trace found in two orchards, wood canker phase only in Nova Scotia. Incidence much lighter than in most years.

R. G. Ross
Kentville, N.S.

Details on Current Fire Blight Research Reported from some Universities and Experiment Stations

Colorado

In 1978 we made blossom inoculations in the orchard to establish infe[illegible] in our test block. We plan to study overwintering of cankers -- survi[illegible] time of oozing, etc.

N. S. Luepschen
Colorado Branch Expt. Sta.

Illinois

Studies concerning the mobility and chemotactic responses of E. amylovor[illegible]

S. M. Ries
Univ. of Illinois

Michigan

1. Development of a differential medium for Erwinia amylovora.

2. Detection of 2 bacteriophages and their characterizations from aeri[illegible] parts of the tree.

E. J. Klos
Michigan State Univ.

Missouri

1. It has been demonstrated conclusively that there is a positive correlation between the amount of extracellular polysaccharide and virulence of E. amylovora.

   Virulent strains - ooze production
   Avirulent strains - no ooze production

2. We are now tracing the movement of bacteria in internal plant tissue[illegible] through the use of C_{14} labelled E. amylovora.

R. N. Goodman
Univ. of Missouri

New York

1. Bacteriocins that affect Erwinia amylovora

2. Factors affecting inoculum production and release by fire blight cankers

3. Epidemiology of fire blight development

4. Production by E. amylovora and influence of the extra-cellular polysaccharide amylovorin

S. V. Beer
Cornell University

Oregon

No current research on fire blight is being conducted at Southern Oregon Experiment Station or OSU but a small one has and will be continued at Mid-Columbia Experiment Station at Hood River by Dr. Robert Spatz. We are working with the extension service (Robert Rackham) for plotting of active fireblight in the spring so to indicate the dates of active blight. We have observed new introduction of pears for fireblight susceptibility.

P. B. Lombard
South Oregon Experiment Station

Virginia

I am back on the drawing board to work out a new program to combat fire blight following a destructive hailstorm.

C. R. Drake
Virginia Polytech. Inst.

Washington

1. Studies are underway to correlate the number of fire blight infections to the number of rattail blooms at various mean temperatures. Our current recommendation, in general, is not to spray unless blossoms are present. How many blossoms per tree does this involve?

2. Studies are underway on the effect of injury at one point on the infectability at another point.

R. P. Covey
Tree Fruit Research Center

Canada

The effect of rootstock on scion susceptibility in apple was studied with results indicating a rootstock-scion interaction occurring for some

combinations of scions and rootstocks. An extended streptomycin spray program for control of shoot blight of pear reduced disease significantly when streptomycin was applied by the grower following periods of rainfall. A three year study of apple and pear buds indicated that Erwinia amylovora was not a common resident of dormant buds, however it was found in high numbers in cankers during the winter, especially cankers that occurred on the current year's growth of wood. Strain differentiation was noted in E. amylovora when inoculated into mature apple and pear tissue of different levels of resistance.

W. G. Bonn
CDA Research Station

Harrow pear selection HW601 fruited on seedling rootstocks and HW602 and HW603 on Old Home framework. All selections performed well and remain fire blight resistant. HW602 and HW603 appear to be commercially promising. HW602 has processing quality equal to Bartlett and HW603 is an early ripening selection which could replace Clapp's Favorite. A new early ripening selection was propagated for grower trials as HW604. Another new selection, HW605 which stores as well as Anjou and Bosc and is better in quality was placed in advance trial.

H. Quamme
CDA Research Station

Denmark

1. Assessment of fire blight susceptibility of ornamental woody Rosaceae species and cultivars under natural conditions.

2. The influence of clipping on the incidence of fire blight in Crataegus hedges.
   Experimental plots: Boto, Falster and Vestergammelby, Southwest Jutland.

   A. Jensen & H. A. Jorgensen
   Plant Pathology Institute
   J. Simonsen,
   Studsgaard Expt. Sta.

3. Assessment of fire blight susceptibility of Crataegus clones under natural conditions; Experimental plots same as #1.

   F. Christensen
   Royal Veter. and Agric. Univ.

4. Overwintering of Erwinia amylovora and symptomless infections in Crataegus.

   J. Hockenhull
   Royal Veter. and Agric. Univ.

England

Weather and potential for fire blight activity

Modifications of the system, for use in spring only when water demands of trees are low, have proved successful. During spring blossom, periods when temperatures allow a daily protential doubling (PD) of 9.0 or more are now counted as infection days.

Assessments of the system so far in other climatic areas suggest that it may be of general value without undue modification. I can advise those, who wish to try it.

E. Billing
East Malling Research Station

Capsulation, extracellular polysaccharde and virulence

Both capsulation and extracellular polysaccharide production are associated with virulence, but the existence of an avirulent, capsulated, polysaccharde-producing strain shows that at least one other factor is involved in virulence.

This suggestion is supported by the fact that this strain, when co-inoculated with a non-capsulated avirulent strain, produced symptoms in pear fruits and apple shoots.

R. A. Bennett
Agr. Res. Council, Letcomb Lab.

France

1. Biological control of Fire blight

Experiments with antogonistic bacteria and phages (mixed inoculation in the growth chamber) are still going on. Interesting results could be achieved with the use of P. syringae, which gives good protection of inoculated plants.

2. Chemical control (copper compounds as compared to streptomycin).
3. Susceptibility of varieties (pear, apple and ornamentals) in open air.
4. Aging of recently isolated strains.

J. P. Paulin
Inst. Nat. Rech. Agron.

West Germany

The plant protection service of Hannover in cooperation with myself from the Federal Biological Research Centre for Agriculture and Forestry made

some experiments with the "monitoring system" of Miller and Schroth in 1977. The results were negative, only by visually appearing new infections the pathogen could be isolated.

The current research at our station mainly is concerned with the following topics:
1. Epidemiology on ornamentals;
2. Bioassay of ornamentals and fruit trees with the toxin of E. amylovora;
3. Control of the disease with new chemical components.

At the University of Hamburg, Professor Knoesel is mainly working on phytiological effects of streptomycin after fire blight infection.

W. Zeller
Biolog. Bundesanstalt

The Netherlands

1. Breeding for resistance in the Genus Pyracantha and Cotoneaster. Propagation of cultivars from various collections and preparation of seedlings from seeds obtained from various botanical gardens in the world, to be tested for resistance.

   J. Heyting
   Res. Sta. for Arboric.

2. Testing for resistance of cultivars and seedlings of Pyracantha, Cotoneaster, Crataegus and Sorbus. The cultivars were obtained from the various collections present in the Netherlands. Seeds were obtained from a large number of botanical gardens in Europe.

   A survey will be started to investigate the population dynamics of the fire blight bacteria in flowers of susceptible and non-susceptible hosts in an infected area.

   A study will be started on the presence of epiphytic bacteria in flowers and their influence on the population density of E. amylovora.

   H. P. Maas Geesteranus
   Res. Inst. for Plant Protect.

3. Infection data of the past will be made available to Dr. E. Billing (G.B.) in order to check her criteria for a warning system.

   C. A. R. Meijneke
   Plant Protect. Service

4. Screening of new bactericides. Relation between epidemiology and timing of sprays.

   T. Kooistra
   Plant Protect. Service

5. Sources of tolerance in geographic populations of Crataegus species to fire blight.

H. M. Heybroek
Dorschkamp Res. Inst. for
Forestry and Landscape Planning

6. Disturbing influence of fire blight in Crataegus hedges on the fields of nature conservation and landscape protection.

G. J. Saaltink
Res. Inst. for Nature Management

Italy

In Italy the research on the disease is restricted to the analysis of "fire blight"-like cases on rosaceous plants grown in Italy or imported from North Europe. During the past summer from cankers on blighted pear branches, we isolated Nectria spp. From EM and MM apple seedlings with blighted apexes and necrosis on the stem, we isolated Sclerotinia spp.

C. Bazzi
Istituto Patol. Veget.

Sweden

The plant protection service of the National Board of Agriculture makes every year an investigation in the southern part of Sweden for the fire blight disease. The investigated area is the south coast of Sweden and there is included wild Crataegus, pear trees and orchards, Cotoneaster, Pyracantha and other susceptible ornamentals. This survey starts after mid-June and goes on till September. Suspected samples are tested in the laboratory at the National Board of Agriculture.

K. Olsson
Univ. of Agric. Sciences

FUTURE MEETINGS

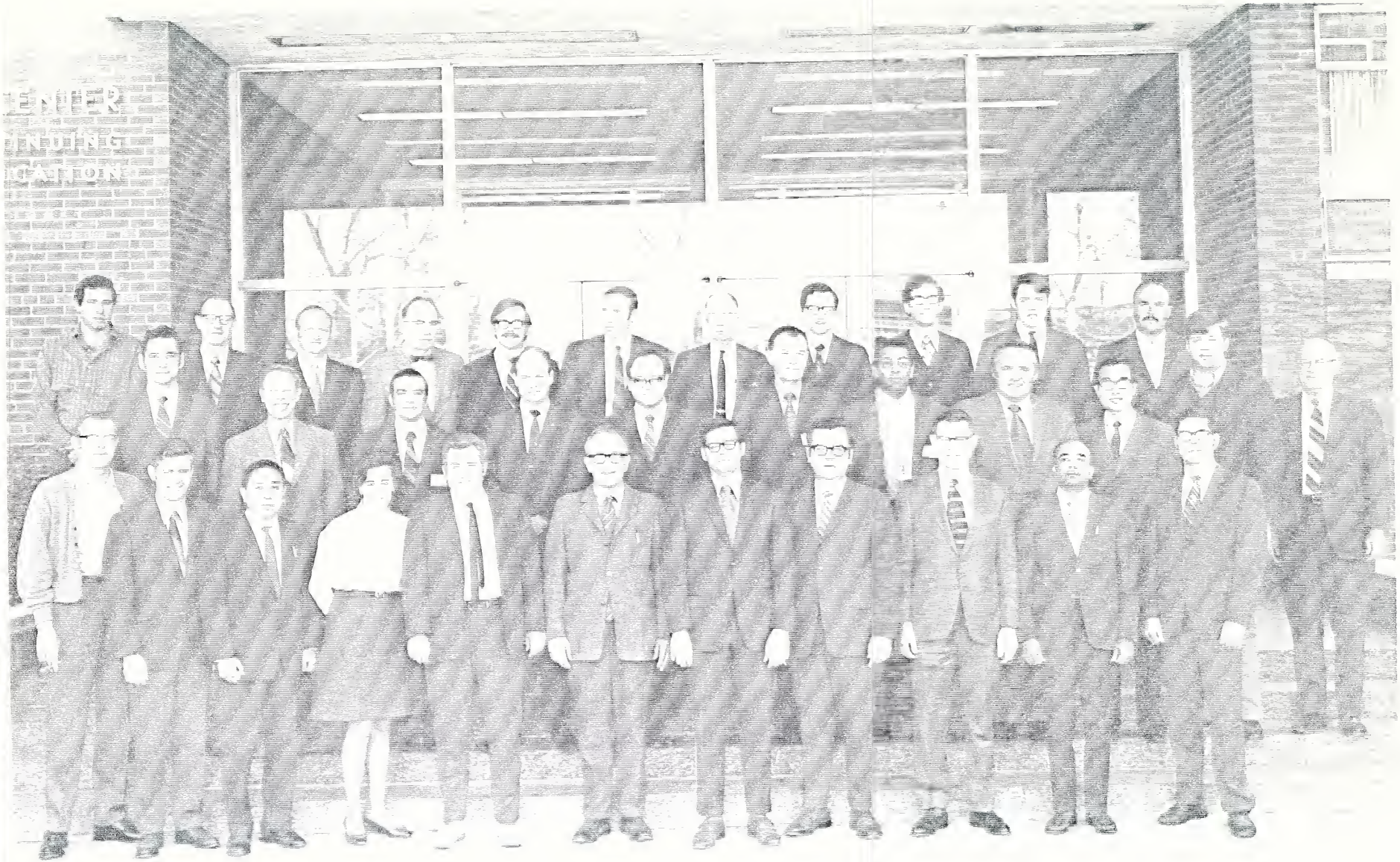
August 5-12	IX International Congress of Plant Protection, Washington, D.C., USA. For details, contact Dr. B. G. Tweedy, Ciba-Geigy, Box 11422, Greensboro, North Carolina 27409.
September 3-7	Eucarpia meeting on Tree Fruit Breeding, Angers, France. For details, contact Mr. Yves Lespinasse, I.N.R.A., Station d'Arboriculture Fruitiere, Beaucouze 49000 Angers.
October 2-4	ABC-PBC meeting, a combined biennial conference of the North American Apple and Pear Breeders Cooperatives. For details, contact Dr. E. B. Williams, Purdue University, West Lafayette, Indiana.
1980	International Workshop on Fire Blight under auspices of the International Society for Horticultural Science, to be held at the Federal Biological Research Center of Agriculture and Forestry in Kiel/Schilksee, West Germany (BRD) on the Baltic Sea coast, September 1980. Further details will be sent in early summer 1979.
1982	XXI International Horticultural Congress, Hamburg, West Germany (BRD).

Locations reporting cultures of E. amylovora available for exchange purposes

1.	Angers	-	Paulin, J. P.
2.	Columbia	-	Goodman, R. N.
3.	Copenhagen	-	Hockenhull, J.
4.	East Lansing	-	Klos, E. J.
5.	East Malling	-	Billing, E.
6.	Heikendorf	-	Zeller, W.
7.	Ithaca	-	Beer, S. V.
8.	Urbana	-	Ries, S. M.
9.	Wageningen	-	Maas Geesteranus, H. P.
10.	Wenatchee	-	Covey, R. P.

Miscellaneous News

There are still 6 copies available of the Proceedings of the Third Workshop on Fire Blight Research held in Ithaca, New York, September 20-22, 1976. There is no cost; first come first serve. Please contact T. van der Zwet, USDA, Fruit Laboratory, Beltsville, Maryland.



SECOND FIRE BLIGHT WORKSHOP
APRIL 6 & 7, 1971 MICHIGAN STATE UNIVERSITY

Participants in the Second Fire Blight Workshop held at
Michigan State University, East Lansing, April 6-7, 1971

Top Row — Y. Pinkos, Earl Wade, Hal Shaffer, Ed Williams, Herb Aldwinckle, Alan Jones, Ken Parker, John Hartnett, John McIntyre, Keith Yoder, Norm Luepschen.

Center Row — D. Kenney, Bob Goodman, Dick Layne, Tom van der Zwet, Ralph Paisley, Charles Drake, Paris Allen, Ed Klos, Chung-Ho Chuang, Allan Wrather, Al Kenworthy.

Bottom Row — Sidney Davidson, Duane Coyier, H. Chow, Halina Novacka, Ron Covey, Iain MacSwan, Ken Hickey, Charles Barnett, Harry Keil, Ben Dhavantari, Steve Beer.

SURVEY OF FIRE BLIGHT RESEARCH IN THE UNITED STATES, CANADA AND EUROPE

(November 1977)

Country/State	Investigator	Discipline	Full-time effort percent	Support personnel number	Source of support	Objectives
UNITED STATES						
Arkansas:						
Fayetteville	Slack, D. Rom, R. C.	Pathology Horticulture	5		State	Several phases of fire blight control; testing pear selections for blight resistance.
California:						
Berkeley	Schroth, M. N.	Pathology	15	5.1	State, Fed. Ext.	Study ecology, biology and variation of Erwinia amylovora; chemical and biological control; monitor bacterial population on pear trees.
Davis	Moller, W. J.	Pathology	20		State, Fed. Ext., Hatch, Indus.	Field evaluation of E. amylovora monitoring and its relation to blight control.
	Ryugo, K.	Physiology	10	.01	State	Evaluating hybrid resistance in pears.
	Beutel, J.	Pomology	5	.3	State	Culture of pears and blight control.
	Starr, M. P.	Bacteriology	25	.5	State	Study ecological genetics of Erwinia, particularly virulence in E. amylovora.
Colorado:						
Grand Junction	Luepschen, N. S.	Pathology	20	2.0	State, Hatch, Indus.	Evaluating new chemicals for blight control and field inoculation techniques.
Delaware:						
Wilmington	Davidson, S.	Pathology	25	.5	Indus.	Evaluating new chemicals for blight control.

Georgia:						
Byron	Thompson, J. M.	Horticulture	25	.2	Fed. (USDA)	Breeding and evaluating apple selections for blight resistance: cooperating with pear program at Beltsville, MD.
Illinois:						
Urbana	Ries, S.	Bacteriology	10	.1	Hatch	Epidemiology and chemotaxis.
Indiana:						
Lafayette	Williams, E. B.	Pathology	2	.1	State, Hatch	Field survey for blight resistance in scab resistant apple seedlings
	Janick, J.	Horticulture	15	.3	State, Hatch	Breeding pears for blight resistance.
Kentucky:						
Lexington	Kuc, J.	Biochemistry	5	.5	State	Microbial induced protection of apples and pears against E. amylovora.
Maryland:						
Beltsville	van der Zwet, T.	Pathology Breeding	100	1.5	Fed. (USDA)	Breeding pears for blight resistance; genetic studies of blight inheritance; improvement of inoculation techniques: study relation of artificially inoculated seedlings with naturally infected trees: determining degree of resistance in various pear tissues.
Michigan:						
East Lansing	Klos, E.	Pathology	20	.7	State, Indus.	Role of bacteriophage in relation to blight control; evaluating new chemicals for blight control: study ways to increase effectiveness of compounds; determing role of yellow Erwinia; monitoring E. amylovora populations; surveying for resistant individuals.
	Carlson, R. F.	Horticulture	1		State	Breeding and selecting pear varieties resistant to blight.
	Jones, A.	Pathology	5		Fed. Ext.	Developing better timing of fire blight treatments; monitoring E. amylovora populations.

Minnesota:						
St. Paul	Stushnoff, C.	Horticulture	10	.5	State	Breeding and evaluating apple selections for blight resistance.
Missouri:						
Columbia	Goodman, R. N.	Pathology	25	2.0	State, Natl. Sci. Found., Hatch, Indus.	Study host specificity, biochemical properties, and mode of action of E. amylovora toxin: developing bioassay with toxin for evaluating blight resistance of pear and apple seedlings.
	Politis, D.	Bacteriology	100			
	Ayers, A.	Bacteriology	100			
	Suhayda, C.	Pathology	50			
New Jersey:						
New Brunswick	Hough, L. F.	Horticulture	10	.05	State, Hatch	Evaluation of pear seedlings with oriental parentage for fire blight resistance.
	Bailey, C. H.	Horticulture	10			
Rahway	Landis, W. R.	Pathology	1	.5	Indus.	Field evaluation of chemical for blight control.
New York:						
Geneva	Aldwinckle, H. S.	Pathology	20	.5	State, Hatch	Developing inoculation techniques to evaluate resistance of apple cultivars and seedlings in breeding program; evaluating new chemicals for blight control.
	Szkolnik, M.	Pathology	2			
	Gilpatrick, J.	Pathology	10	.1		
	Norelli, J. L.	Pathology	100			
	Cummins, J. N.	Horticulture	10	.1	State, Hatch	Breeding and evaluating apple rootstocks for blight resistance.
	Lamb, R. C.	Horticulture	1	.02	State, Hatch	Breeding and evaluating pear seedlings for blight resistance.
	Way, R. D.	Horticulture	3	.03	State, Hatch	Breeding and evaluating apple selections for blight resistance.
Ithaca	Beer, S. V.	Pathology	50	1.0	State, Hatch	Epidemiological, physiological, and biological factors affecting blight infection and resistance.
Middleport	French, J. P.	Pathology	1	.5	Indus.	Evaluating new chemicals for blight control.
New York	Carroll, V.	Biochemistry	15	1.2	Indus.	Evaluating new chemicals for blight control.
Syracuse	Abdel-Rahman, M.	Horticulture Pathology	20	2.0	Indus.	Evaluating chemicals for blight control; teaching field agents latest methods of blight control.

North Carolina:						
Goldsboro	Bates, J. J.	Pathology	5	.1	Indus.	Field testing of chemicals for blight control.
Raleigh	Ritchie, D. F.	Pathology	1	.01	State	Evaluating pear seedlings in the field for blight resistance.
Ohio:						
Wooster	Blake, R. C.	Horticulture	100	1.0	Fed. (USDA) State	Breeding pears for blight resistance (cooperative program with USDA in Beltsville, MD).
Oregon:						
Hood River	Spotts, R. A.	Pathology	15	.1	State	Effect of overhead tree misting in pear orchard on incidence of fire blight; testing chemicals for blight control.
Medford	Rackham, R.	Pathology	5		State, Hatch	Monitoring E. amylovora in pear orchards.
	Lombard, P. B.	Horticulture	15		State	Examing pear rootstocks and selections for blight resistance.
Pennsylvania:						
Biglerville	Hickey, K. D.	Pathology	5		State	Evaluating new chemicals for blight control; monitoring for tolerance.
Utah:						
Logan	Thomson, S. V.	Pathology	10		State	Monitoring bacterial populations on pears, apples and ornamentals.
Virginia:						
Blacksburg	Drake, C. R.	Pathology	8		State, Indus.	Determining whether pear industry can be established in Virginia.
Winchester	Yoder, K.	Pathology	5	.1	State, Indus.	Evaluating new chemicals for blight control.
Washington:						
Wenatchee	Covey, R. P., Jr.	Pathology	40	.5	State	Evaluating new chemicals for blight control; study effect of environmental factors and bacterial population on blight development: surveying extent of streptomycin resistance.
Wisconsin:						
Madison	Heimann, M. F.	Pathology	2		State	Diagnosis of fire blight.

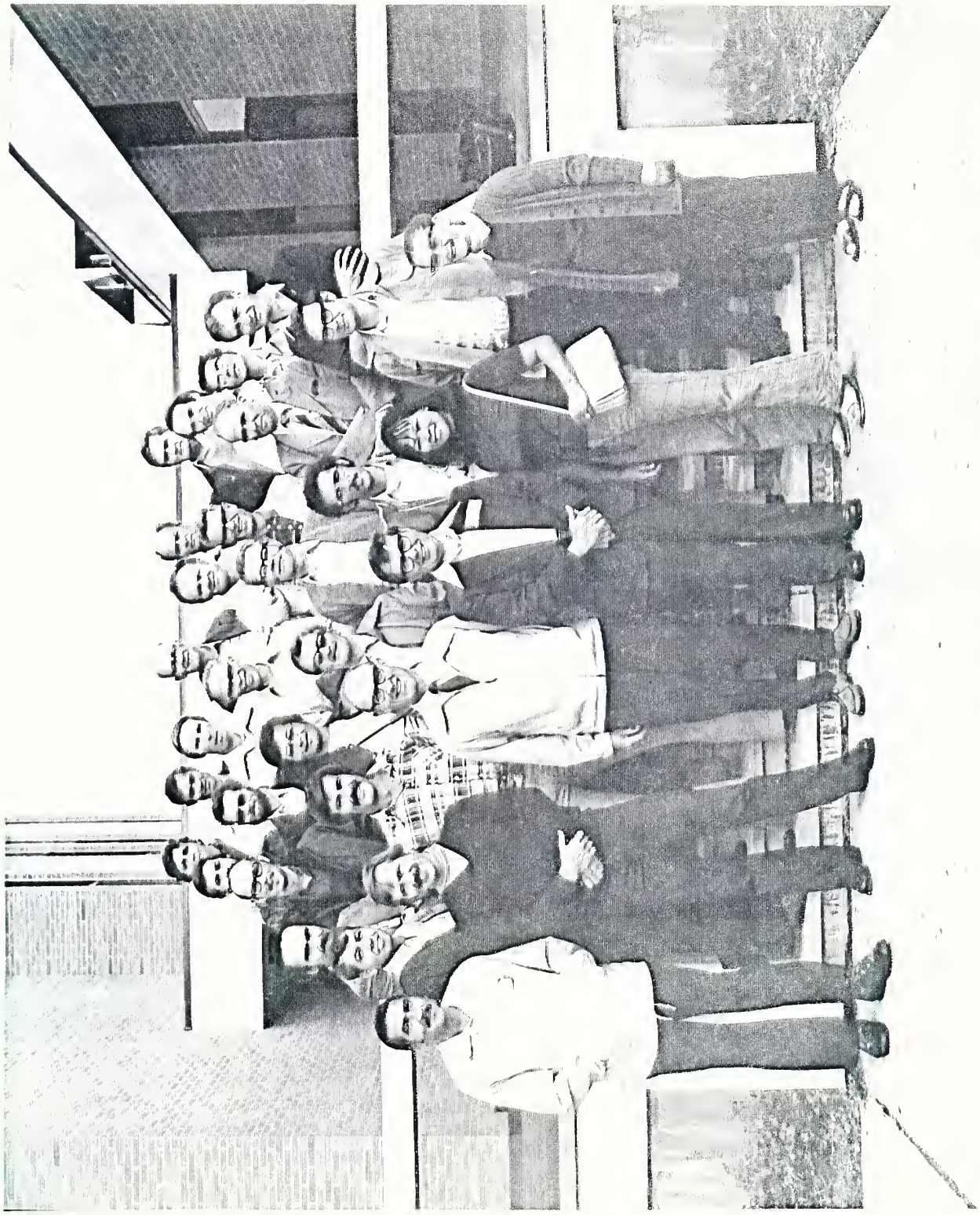
District of Columbia:	Egolf, D. R.	Horticulture	20	1.0	Fed. (USDA)	Breeding and evaluating crabapple, pyracantha and cotoneaster for blight resistance.
CANADA						
British Columbia:						
Summerland	Yorston, Y. M.	Pathology	10	.75	Canad. and Columbia Dept. Agr.	Monitoring populations of E. amylovora in irrigated and non-irrigated pear and apple trees; study elimination of E. amylovora from fruit being exported.
Ontario:						
Guelph	Gibbins, L. N.	Bacteriology-physiology	30	3.0	Natl. Res. Council of Canada	Physiology of cytoplasmic membrane of E. amylovora with particular reference to the effect of inhibitors.
Harrow	Quamme, H.	Horticulture	100	1.0	Canad. Dept. Agr.	Breeding and evaluating blight resistant varieties of pear and dwarfing rootstocks; study inheritance of resistance.
	Bonn, W. G.	Pathology	50	.5	Canad. Dept. Agr.	Developing satisfactory control measures by studying epidemiology and environmental factors; monitoring E. amylovora in orchards.
Simcoe	Hunter, C. L.	Pathology	5	.05	Hort. Res. Inst. of Ontario	Survey of fire blight in apples on M26 rootstock in Ontario.
Vineland	Cline, R. A.	Plant Nutrition	2	.05	Hort. Res. Inst. of Ontario	Effect of rootstocks and nutrients on fire blight.

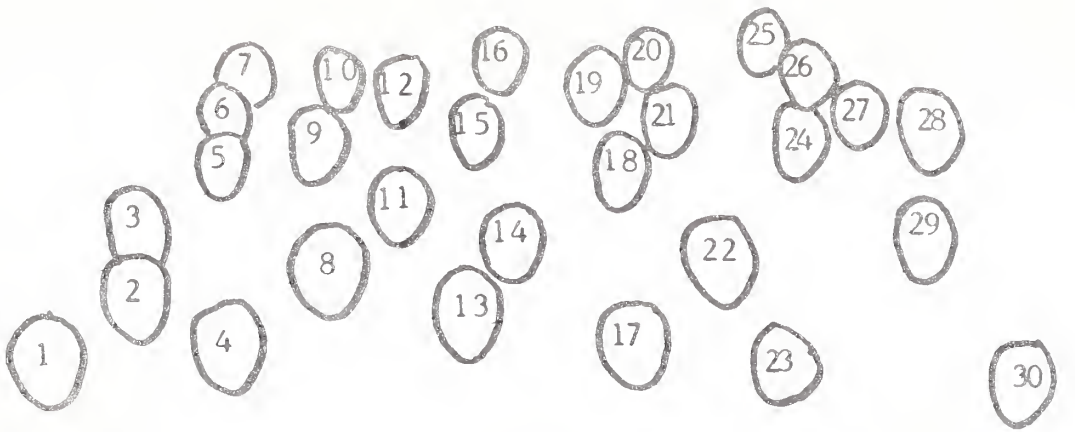
EUROPE

Belgium:						
Merelbeke	Veldeman, R. Geenen, J.	Pathology	10	0.05	Fed.	Diagnostic methods: epidemiology; host plant flowering time and bees.
Denmark:						
Copenhagen	Hockenhull, J.	Bact./physiol. Horticult. Pathology	40 10 40	0.1	Univ.	Overwintering of E. amylovora in cragaegus - sites and numbers; symptomless infections - ingress through leaves into the xylem; longevity of bacteria: use of fluorescent antibody techniques in the identification and location of E. amylovora in host tissue.
Herning	Simonsen, J.	Pathology	5	0	Fed	Influence of cutting and pruning of Crataegus shelter belts and hedges on infection and disease severity.
Horsholm	Christensen, F. G.	Breeding	25	0	Univ.	Selection of resistant plants. Breeding for resistance in indigenous Crataegus.
Lyngby	Jensen, A. Jorgensen, H. A.	Pathology	30	0.25	Fed.	Diagnosis: resistance testing of host plants (ornamentals) under field conditions.
England:						
Maidstone	Billing, E.	Bact./physiol.	100	1.0		Epidemiology - forecasting and control.
	Alston, F.	Breeding Pathology	5 95			Pear breeding.
Wantage	Bennett, R. A.	Biochem.	5			Early stages of infection.

France:						
Angers	Samson, R.	Bact./Physiol.	20	1.0	Fed	Serology of the genus Erwinia; serological identification of E. amylovora.
	Paulin, J. P.	Bact./Physiol. Breeding Pathology	30 10 40	1.0	Fed	Epidemiology, ecology of E. amylovora on host plants; biological control; phage typing of E. amylovora strains.
Germany (East):						
Aschersleben	Kleinhempel, H.	Bact./Physiol Horticult. Pathology	10 10 10	1.0	Fed	Diagnosis, pathology and control measures of fire blight.
Germany (West):						
Arensburg	Reinmann-Philipp, R. Persiel, F.	Breeding Horticult. Pathology	30 30 50		Fed	Breeding for resistance in Cotoneaster.
Dossenheim	Seemuller, E. Schmidle, A.	Biochemistry/ pathology	5	0.33	Fed	Resistance testing of apple and pear cultivars; biochemical aspects of resistance.
Heikendorf	Zeller, W.	Pathology	100	1.0	Fed	Control - chemical and cultural methods.
Husum	Meyer, J.	Bact./Physiol Biochemistry	20 10	3.0		Resistance testing of apple, pear and ornamentals under field conditions.
Kiel	Schulz, F. A. Schroder, C.	Biochemistry Pathology	100 100		Univ.	Epidemiological studies on ornamentals and fruit under Schleswig-Holstein conditions; patho-physiological studies - infection and pathogenesis.

Netherlands:						
Boskoop	Heyting, J.	Horticult. Pathology	15 25		Fed.	Testing for susceptibility of ornamental shrubs.
Wageningen	Meijneke, C.A.R.	Pathology			Fed.	Secretary of the Dutch Fire Blight Working Group.
	Kooistra, T.	Pathology			Fed.	Methods of fire blight control.
	Heybroek, H. M.	Breeding				Development of resistant indigenous Crataegus.
	Maas Geesteranus, H. P.	Bacter./Physiol.	10	1.0	Univ.	Diagnosis, serology.
Poland:						
Skierniewice	Sobiczewski, P.	Bacteriol. Pathology	25 25	2.0		Prevention of introduction and establishment of fire blight in Polish orchards and fruit nurseries; diagnosis and field inspection of apple, pear and hawthorn.





Participants in the APDW 3rd Fire Blight Workshop held at Ithaca, N. Y., visit to New York State Agricultural Experiment Station, Geneva. Photo by G. Catlin

1. M. Abdel-Rahman (New York)
2. P. C. Pecknold (Indiana)
3. W. Zeller (Germany)
4. H. S. Aldwinckle (New York)
5. S. M. Ries (Illinois)
6. W. G. Bonn (Ontario)
7. G. T. Berggren (Missouri)
8. D. C. Opgenorth (Wisconsin)
9. A. G. Otterbacher (Illinois)
10. A. K. Chatterjee (California)
11. G. L. Rousselle (Quebec)
12. A. L. Jones (Michigan)
13. E. K. Wade (Wisconsin)
14. L. J. Coulombe (Quebec)
15. R. N. Goodman (Missouri)
16. R. C. Blake (Ohio)
17. J. Kuc (Kentucky)
18. S. H. Davidson (Delaware)
19. M. N. Schroth (California)
20. T. van der Zwet (Maryland)
21. H. L. Keil (Maryland)
22. D. F. Ritchie (Michigan)
23. C. Helkie (Maryland)
24. C. A. R. Meijneke (The Netherlands)
25. V. J. Carroll (New York)
26. R. C. Seem (New York)
27. S. V. Beer (New York)
28. L. N. Gibbins (Ontario)
29. S. V. Thomson (California)
30. E. Billing (England)

Workshop participants not present for the picture were: J. J. Albert (West Virginia), P. A. Arneson (New York), D. Chandler (Washington, J. N. Cummins (New York), R. S. Dickey (New York), W. M. Dowler (Maryland, J. D. Gilpatrick (New York), J. E. Hunter (New York), E. J. Klos (Michigan), J. W. Lorbeer (New York, R. C. Lamb (New York), W. R. Landis (New Jersey), J. L. McIntyre (Connecticut), W. J. Moller (California), K. G. Parker (New York), R. C. Pearson (New York), D. H. Petersen (Pennsylvania), J. L. Preczewski (New York), T. M. Sjulin (Illinois), P. W. Steiner (Missouri), D. H. VanEtten (New York), J. Van Gelowe (North Carolina), A. D. Woods (New York)

LIST OF PERSONS INTERESTED IN FIRE BLIGHT 1/

Abdel-Rahman, M., Fertilizer-Chemical Division, Agway Inc., P.O. 4933, Syracuse, New York 13221. (315-477-6176)	(1)	USA
Aldwinckle, H. S., Department of Plant Pathology, N.Y. State Agric. Expt. Station, Geneva, New York 14456. (315-787-2317)	(1)	USA
Alston, F. H., Fruit Breeding Section, East Malling Research Station, East Malling, Maidstone, Kent, ME19 6BJ, England	(1)	UK
Andersen, H., The Government Plant Protection Service, Gersonsvej 13, 2900 Hellerup, Denmark. (01-620787)	(1)	DK
Ark, P. A., St. Pauls Towers, 100 Bay Place, Apt. 1915, Oakland, California 94610. (415-835-4700 ext. 293)	(4)	USA
Arsenijevic, M., Faculty of Agriculture, Institute for Plant Protection, Akademska 2, 21000 Novi Sad, Yugoslavia. (021-58-366)	(3)	YUG
Bailey, Catherine H., Department of Hort. & Forestry, N.J. Agric. Expt. Station, P.O. Box 231, New Brunswick, New Jersey 08903. (201-932-9389)	(2)	USA
Barrat, J. G., W. Va. University Expt. Farm, Kearneysville West Virginia 25430. (304-267-4712)	(2)	USA
Bates, J. J., Biological Research Center, Imperial Chemicals Inc., P.O. Box 208, Goldsboro, North Carolina 27530. (919-736-3030)	(2)	USA
Baykal, N., A.U. Ziraat Fakultesi, Fitopatoloji Kursusu, Ankara, Turkey	(3)	TUR
Bazzi, C., Istituto Patologia Vegetale, University of Bologna, via Filippo Re 8, 40126 Bologna, Italy. (227401)	(3)	ITA

1/ Names underlined are contact persons for preparation of fire blight newsletter. Numbers in parenthesis are local telephone and those in column at right indicate activity or interest in fire blight:

1. Actively engaged in fire blight research;
2. Indirectly interested in fire blight;
3. Interested in fire blight, but located in region where disease is not present;
4. Retired but still interested in fire blight activities.

Beer, S. V., Department of Plant Pathology, Cornell University, Ithaca, New York 14853. (607-256-3259) (1) USA

Bennett, R. A., Agricultural Research Council, Letcombe Laboratory, Wantage, Oxfordshire OX12 9JT, England. (Wantage 3327) (2) UK

Berggren, J., Kalo Laboratories, Inc., 9233 Ward Parkway, Kansas City, Missouri 64114. (816-363-1800) (2) USA

Beutel, J. A., Department of Pomology, University of California, Davis, California 95616. (916-752-0507) (1) USA

Biehn, W., Ciba Geigy Corporation, Yakima, Washington 98901. (2) USA

Billing, E., Plant Pathology Section, East Malling Research Station, East Malling, Maidstone, Kent, ME19 6BJ, England. (0732-843833) (1) UK

Blake, R., Department of Horticulture, Ohio Agric. Res. & Devel. Center, Wooster, Ohio 44691. (216-264-1021 ext. 275) (1) USA

Bolay, A., Section de Phytopathologie, Station Federale de Recherches Agronomiques de Changins, 1260 Nyon, Switzerland. (022-615451) (3) SWT

Bonn, W. G., Canada Agriculture, Research Station, Harrow, Ontario NOR 1G0, Canada. (519-738-2251) (1) CND

Bredemeier, D., Universidade Federal de Santa Maria, Departamento de Fitotecnia, 97-100 Santa Maria, Rio Grande do Sul, Brazil (3) BRA

Burr, T. J., Department of Plant Pathology, N.Y. State Agric. Expt. Station, Geneva, New York 14456. (315-787-2312) (2) USA

Bushong, J. W., Agrichemicals Project, 3M Center, Bldg. 223-6SE, Minnesota Mining & Manufacturing Comp., St. Paul, Minnesota 55101. (612-733-0368) (2) USA

Cameron, H. R., Department of Botany & Plant Pathology, Oregon State University, Corvallis, Oregon 97330. (503-754-4044) (2) USA

Carlson, R. F., Department of Horticulture, Michigan State University, East Lansing, Michigan 48823. (517-355-5200) (2) USA

Carroll, V. J., Chemicals Division, Pfizer Inc., 235 East 42nd, New York, New York 10017. (212-573-2643) (1) USA

Chandler, D., 1006 S. 32nd Avenue, Yakima, Washington 98902. (509-253-3414) (2) USA

Christensen, F. G., The Royal Veterinary and Agricultural University, Arboretum, 2970 Horsholm, Denmark. (02-860641) (2) DK

Civerolo, E. L., U.S. Department of Agriculture, Fruit Laboratory, Room 111, Building 004, BARC-West, Beltsville, Maryland 20705. (301-344-3569) (2) USA

Clayton, C. N., Department of Plant Pathology, North Carolina State University, Raleigh, North Carolina 27607. (919-737-2721) (4) USA

Cline, R. A., Horticulture Research Institute of Ontario, Vineland Station, Ontario LOR 2EO, Canada. (416-562-4141) (2) CND

Cornils, H., Inst. fur Angewandte Botanik, Univ. of Hamburg, Marseillerstr. 7, D2000 Hamburg 36, West Germany. (040-4123-2359) (1) BRD

Coulombe, L. J., Canada Agriculture, P.O. Box 457, St. Jean, Quebec J3B 6B8, Canada. (514-346-4494) (2) CND

Covey, R. P., Tree Fruit Research Center, 1100 North Western Avenue, Wenatchee, Washington 98801. (509-663-8181) (1) USA

Crowe, A. D., Canada Agriculture, Tree Fruit Section, Research Station, Kentville, Nova Scotia, Canada. (902-678-2171) (2) CND

Cummins, J. N., Department of Pomology & Viticulture, N.Y. State Agr. Expt. Station, Geneva, New York 14456. (315-787-2233) (1) USA

Dale, T., Norwegian Plant Inspection Service, P.O. Box 94, Okern, Oslo 5, Norway. (02-224760) (3) NOR

Davidson, J. G. N., Canada Agriculture, Research Station, Box 29, Beaverlodge, Alberta TOH OCO, Canada. (403-354-2212) (2) CND

Davidson, S. H., DuPont de Nemours & Company, Expt. Station, Bldg. 268, Wilmington, Delaware 19898. (302-772-2814) (1) USA

Dowler, W. M., U. S. Dept. of Agric., National Program Staff, Room 328, Bldg. 005, BARC-West, Beltsville, Maryland 20705. (301-344-3915) (2) USA

Drake, C. R., Department of Plant Pathology & Physiology, Maryland Virginia Polytechnic Institute, Blacksburg, Virginia 24061. (703-951-5251) (2) USA

Dye, D. W., Plant Diseases Division, Dept. of Scientific & Industr. Research, Private Bag, Auckland, New Zealand (2) NZ

Egolf, D. R., U. S. National Arboretum, 24 & R Streets, N.E., Washington, D. C. 20002. (202-399-5400) (1) USA

Egli, T., Ciba-Geigy Chem. Company Ltd. AC 2.82, 4002 Basel, Switzerland. (3) SWT

Ercolani, G. L., Istituto di Microbiologia Agraria e Tecnica, Facolta di Agraria, Via Amemdola 165/A, 70126 Bari, Italy. (080-339422) (3) ITA

Erskine, J. M., Stauffer Chemical S. A., P. O. Box 78417, Sandton 2146, Transvaal, South Africa (Johannesburg 783-7250) (2) SA

Evans, I. Plant Industry Laboratory, Alberta Agriculture, 6909-116 St., Box 8070, Edmonton, Alberta T6H 4P2, Canada (2) CND

Fox, R. T. V., I.C.I., Plant Protect Division, Jealott's Hill Res. Station, Bracknell, Berkshire RG12 6EY England. (0344-24701) (2) UK

French, J. P., Food and Machinery Corp., 100 Niagara Street, Middleport, New York 14105. (716-735-3761 ext. 361) (2) USA

Fucikovsky, L., Rama de Fitopatologia, Colegio de Postgraduados, Escuela Nacional de Agricultura, Chapingo, Mexico. (5-85-45-55-ext. 217) (2) MEX

Garibaldi, A., Istituto di Patologia Vegetale, Via Giuria 15, 10126 Torino, Italy (3) ITA

Geenen, J., Rijksstation voor Plantenziekten, 96 Burg. van Gransberghelaan, 9220 Merelbeke, Belgium. (2) BLG

Gibbins, L. N., Department of Microbiology, University of Guelph, Guelph, Ontario N1G 2W1 Canada (519-824-4120, ext. 3477) (2) CND

Gilpatrick, J. D., Dept of Plant Pathology, N. Y. State Agr. Exp. Station, Geneva, New York 14456. (315-787-2335) (1) USA

Goodman, R. N., Dept. of Plant Pathology, University of Missouri, Columbia, Missouri 65201. (314-882-2418) (1) USA

Goto, M., Laboratory of Plant Pathology, Faculty of Agriculture, Shizuoka University, 836 Ohya, Shizuoka, Japan (3) JAP

Grimm, R. Federal Res. Station for Fruit-growing, Viticulture and Horticulture, 8820 Wadenswill, Switzerland. (01-7801333) (3) SWT

Gupta, V. K., Regional Fruit Research Station, Black Rock, Mashobra, Simla 171007, India. (3) IND

Harnish, W., Agric. Chem. Div., Food & Machinery Corporation 100 Niagara Street, Middleport, New York 14105. (716-735-3761) (2) USA

Heimann, Mary Francis, Dept. Plant Pathology, University of Wisconsin, Russell Labs., 1630 Linden Drive, Madison, Wisconsin. (608-262-1426) (1) USA

Heybroek, H. M., Dorschkamp Research Inst. for Forestry and Landscape Planning, P. O. Box 23, 6700 AA Wageningen, The Netherlands. (08370-19050) (1) NL

Heyting, Johanna, Institute for Hort. Plant Breeding, Research Station for Arboriculture, Valkenburgerlaan 3, 2770 AC Boskoop, The Netherlands (01727-3220) (1) NL

Hickey, K. D., Fruit Research Laboratory, Penn. State Univ., Biglerville, Pennsylvania 17307. (717-677-6116) (2) USA

Hildebrand, Earl M., 11092 Timberline Drive, Sun City, Arizona 85351. (602-977-5326) (4) USA

Hockenhull, J., Dept. of Plant Path., The Royal Veterinary and Agricultural Univ., Thorvaldsensvej 40, 1871 Copenhagen V., Denmark. (01-351788) (1) DK

Hough, L. F., Department of Hort. & Forestry, N. J. Agric. Expt. Station, P. O. Box 231, New Brunswick, New Jersey 08903. (201-932-9389) (1) USA

Hunter, C. L., Soils and Crops Branch, Ontario Ministry of Agriculture and Food, P. O. Box 587, Simcoe, Ontario N3Y 4N5, Canada (519-426-7120) (1) CND

Janick, J., Department of Horticulture, Purdue University, West Lafayette, Indiana 47907. (317-749-2261 ext. 240) (1) USA

Jenkins, P. J., Victorian Plant Research Inst., Swan Street, Burnley, Victoria 3121, Australia. (3) AUS

Jensen, A., State Plant Pathology Institute, Lottenborgvej 2, 2800 Lyngby, Denmark. (1) DK

Johnson, D. E., 3310 Jefferson Avenue, Yakima, Washington 98902 (2) USA

Jones, A. L., Department of Botany & Plant Pathology, Michigan State University, East Lansing, Michigan 48823. (517-355-4573) (2) USA

Jorgensen, H. A., State Plant Pathology Institute, Lottenborgvej 2, 2800 Lyngby, Denmark. (01-8725-10) (2) DK

Joseph, E., Service Phytosanitaire, Div. de l'Agriculture, Martenhofstr. 5, 3003 Bern, Switzerland. (3) SWT

Kado, C. I., Department of Plant Pathology, University of California, Davis, California 95616. (916-752-0325) (2) USA

Kato, T., Research Department, Pesticides Div., Institute for Biological Science, Sumitomo Chemical Co., Ltd., 2-1, 4-Chome, Takatsukasa, Takarazuka, Hyogo, 665, Japan (3) JAP

Kleinhempel, H., Inst. fur Phytopathologie, Theodor-Roemer-Weg 4, 432 Aschersleben, East Germany. (3) DDR

Klement, Z., Dept. of Pathophysiology & Disease Resistance, Research Institute for Plant Protection, Herman Otto u. 15, 1525 Budapest II, Hungary. (358-137) (3) HUN

Klos, E. J., Department of Botany & Plant Pathology, Michigan State Univ., East Lansing, Michigan 48823. (517-355-4535) (1) USA

Knoesel, D., Inst. fur Angewandte Botanik, Univ. of Hamburg, Marseiller Str. 7, 2000 Hamburg 36, West Germany. (040-4123-2353) (1) BRD

Koenigshof, R., Pear Research Association, Box 4050, Kerlikowske Rd., Coloma, Michigan 49038. (616-849-2375) (2) USA

Kooistra, T., Plant Protection Service, Geertjesweg 15, 6706 EA Wageningen, The Netherlands. (08370-19001) (1) NL

Kraus, P., Bayer Chem. Company, Pflanzenschutz Anwendungstechnik, Biologische Forschung, 5090 Leverkusen, Bayerwerk, West Germany. (02172-306081) (3) BRD

Kroeker, G., Swedish Univ. of Agric. Sciences, Box 7036, 75007, Uppsala 7, Sweden. (018-102000) (3) SWD

Kuc, J., Dept. of Plant Pathology, S-305 Agric. Sci. Center North, Univ. of Kentucky, Lexington, Kentucky 40506. (606-258-4978) (2) USA

Kudela, V., Institute of Plant Protection, Research Inst. of Plant Production, Drnovska 507, 16106 Prague 6 (Ruzyne) Czechoslovakia. (3) CZE

Lacy, G. H., Department of Plant Pathology, Conn. Agric. Expt. Station, New Haven, Connecticut 06504 (203-789-7222) (2) USA

Lamb, R. C., Department of Pomology & Viticulture, N. Y. State Agr. Expt. Station, Geneva, New York 14456. (315-787-2235) (1) USA

Lampinen, Maria, National Board of Agriculture, Plant Protection Service, 551 83 Jonkoping, Sweden. (036-169420) (3) SWD

Landis, W. R., Agric. Chem. Development, Merck & Company, Inc., Rahway, New Jersey 07065. (201-574-6605) (2) USA

Lelliott, R. A., Plant Pathology Laboratory, Hatching Green, Harpenden, Herts AL5 2BD, England. (Harpenden 5241) (2) UK

Lombard, P. B., Southern Oregon Expt. Station, 569 Hanley Road, Medford, Oregon 97501. (503-772-5165) (2) USA

Lopez Gonzalez, M., Dept. Proteccion Vegetal, I.N.I.A. CRIDA 07, Moncada-Valencia, Spain (739-1000) (3) SPN

Luepschen, N. S., Colorado State University, Orchard Mesa Research Center, 3168 B½ Road, Grand Junction, Colorado 81501. (303-243-2816) (1) USA

Maas Geesteranus, H. P., Research Inst. for Plant Protection, Binnenhaven 12, 6700 AA Wageningen, The Netherlands. (08370-19151) (1) NL

Massfeller, D., Pflanzenschutzamt, Mittelstrasse 99, P. O. Box 42, 5300 Bonn-2, West Germany. (02221-376931) (1) BRD

Mathys, G., European and Mediter. Plant Protect. Organ., 1 rue Le Notre, 75016 Paris, France. (870-77-94) (3) FR

Matthee, F. N., Plant Path. Division, Fruit and Food Technology Research Institute, Private Bag X. 5013, Stellenbosch, South Africa (2001) (3) SA

Mazzucchi, U., Istituto Patologia Vegetale, University of Bologna, via Filippo Re 8, 40126 Bologna, Italy (227401) (3) ITA

McIntyre, J., Dept. of Plant Pathology, Conn. Agric. Expt. Station, Box 1106, New Haven, Connecticut 06504. (203-789-7257) (2) USA

McPhee, R., Canada Agriculture, Research Station, Summerland, British Columbia VOH 1ZO, Canada. (604-494-7711) (2) CND

McSwan, I. C., Department of Botany & Plant Pathology, Oregon State University, Corvallis, Oregon 97331. (503-754-3472) (2) USA

Meijneke, C. A. R., Plant Protection Service, Geertjesweg 15, 6700 HC Wageningen, The Netherlands. (08370-19001) (2) NL

Meyer, F. C., Ministerio Agric. y Ganad., Instituto Nacional Technol. Agropec. Estacion Exper. Regional Alto Valle, Casilla de Correo 52, 8332 Gral. Roca, Rio Negro, Argentina. (General Avez 2248) (3) ARG

Meyer, J., Amt fur Land-und Wasserwirtschaft, Abt. Pflanzenschutz, Herzog-Adolf Strasse 1b, 225 Husum, West Germany. (04841-2746) (1) BRD

Michel, H. G., Landesanstalt fur Pflanzenschutz, Reinsburgstr. 107, 7000 Stuttgart - 1, West Germany (0711/6676-2575 or 73) (3) BRD

Miller, H. J. Plant Protection Service, Geertjesweg 15, 6700 HC Wageningen, The Netherlands (1) NL

Miller, R. W., Dept. of Plant Path. and Physiol., Clemson Univ., Clemson, South Carolina 29677 (803-656-3450) (2) USA

Moller, W. J., Department of Plant Pathology, University of California, Davis, California 95616. (916-752-0304) (1) USA

Morehead, G. W., California Agric. Extension Service, 650 Capitol Mall, Room 3048, Sacramento, California 95814. (916-454-5461) (2) USA

Mosegaard, J., The Nursery Growers Asso., The Plant Health Council, Government Plant Protect. Service, Gersonsvej 13, 2900 Hellerup, Denmark. (2) DK

Mowry, J. B., Plant and Soil Sci. Dept., Southern Illinois Univ., Carbondale, Illinois 62901. (618-549-3931) (2) USA

Muir, J., Alberta Agriculture, Research Station, Fairview, Alberta, TOH 1LO, Canada. (2) CND

Muller, H. J., Institut fur Phytopathologie, Theodor-Roemer Weg 1-4, 432 Aschersleben, East Germany (3) DDR

Norelli, J. L., Department of Plant Pathology, N.Y. State Agric. Expt. Station, Geneva, New York 14456 (315-787-2317) (1) USA

Noval Alonso, C., Dept. de Proteccion Vegetal, Inst. Nacional de Investigaciones Agrarias, Avenida Puerta de Hierro, Madrid 3, Spain (3) SPN

Oberhofer, H., Sudtiroler Beratungsring fur Obst und Weinbau, A. Hoferstrasse 9, 39011 Lana, Sudtirol, Italy (3) ITA

d'Olivera, Maria de Lourdes, Estacao Agronomica Nacional, Oeiras, Portugal (3) POR

Olsson, K. M., Swedish Univ. of Agric. Sciences, Dept. of Plant and Forest Protection, 171 07 Fack Solna, Sweden. (08-85-01-20) (3) SWD

Opgenorth, D. C., Department of Plant Pathology, Univ. of California, Riverside, California 92507. (714-787-4119) (2) USA

Otterbacher, A., University of Illinois, 105 Horticulture Field Laboratory, Urbana, Illinois 61801. (217-333-1520) (2) USA

Paclt, J., Institute of Experimental Phytopathology and Entomology, Slovak Academy of Sciences, 900-28 Ivanka pri Dunaji, Czechoslovakia. (3) CZE

Palazon, Ignacio, Departamento de Proteccion de Cultivos, Centro de Investigacion y Desarrolo Agrario del Ebro, Montanana 177 (Aula Del), Zaragoza, Spain. (297207) (3) SPN

Panagopoulos, C. G., Benaki Phytopath. Institute, Kiphissia, Athens, Greece. (01-8013619) (3) GRC

Parker, K. G., 18 Congress Street, Trumansburg, New York 14886. (607-387-7934) (4) USA

Paulin, J. P., Station de Phytobacteriologie, I.N.R.A., Route de St. Clement, Beaucouze, 49000 Angers, France. (41-48-51-23) (1) FR

Pecknold, P. C., Department of Botany & Plant Pathology, Purdue University, West Lafayette, Indiana 47907. (317-749-6530) (2) USA

Persiel, F., Bundesforschungsanstalt fur Gartenbauliche Pflanzenzuchtung, Bornkampsweg, 2070 Ahrensburg, West Germany. (04102-51122) (1) BRD

Pirvan, P., Scientific Director, Trustul Pomiculturii, Pitesti-Maracineni, Romania. (976-34.292) (3) ROM

Porreye, W., Research Station of Gorsem, Brede Akker 3, 3800 Sint-Truiden, Belgium. (011-672019) (1) BLG

Preczewski, J. L. Product Development Dept., Stark Brothers Nurseries Co., Louisiana, Missouri 63353 (314-754-5511) (2) USA

Preiser, F., Research Laboratories, Merck and Company, Inc., Bldg. R123-12, Rahway, New Jersey 07065. (201-574-6687) (2) USA

Prillwitz, H. G., Landespflanzenschutzamt, Essenheimerstr. 144, 65 Mainz - Bretzenheim, West Germany (3) BRD

Psallidas, P. G., Benaki Phytopath. Inst., Kifissia, Athens, Greece. (01-8013619) (3) GRC

Quamme, H., Canada Agriculture, Research Station, Harrow, Ontario NOR 1G0, Canada. (519-738-2251) (1) CND

Rackham, R. L., Oregon State Univ. Extension Service, 1301 Maple Grove Drive, Medford, Oregon 97501. (503-776-7371) (1) USA

Reimann-Philipp, R., Bundesforschungsanstalt fur Gartenbauliche Pflanzenzuchtung, Bornkampsweg, 2070 Ahrensburg, West Germany. (04102-51122) (1) BRD

Ride, M., Station de Phytobacteriologie, Institute Nat. Recherche Agron., Route de Saint Clement, Beaucouze 49000, Angers, France. (41-88.22.00) (3) FR

Ries, S. M., Department of Plant Pathology, N427 Turner Hall, University of Illinois, Urbana, Illinois 61801. (217-333-1523) (1) USA

Ritchie, D. F., Department of Plant Pathology, N. C. State University, Raleigh, North Carolina 27650. (919-737-2721) (2) USA

Roed, H., The Norwegian Plant Protection Institute, 1432 As - NLH, Norway. (3) NOR

Rom, R. C., Dept. of Horticulture & Forestry, Univ. of Arkansas, Fayetteville, Arkansas 72701. (501-575-2446) (2) USA

Roosje, G. S., Research Institute for Plant Protection, Binnenhaven 12, 6700 AA Wageningen, The Netherlands. (08370-19151 ext. 10) (2) NL

Rosenberger, D. A., New York Agric. Exp. Station, Box 727, Highland, New York 12528 (914-691-7151) (2) USA

Ross, R. G., Canada Agriculture, Research Station, Kentville, Nova Scotia, Canada. (902-678-2171) (2) CND

Rousselle, G. L., Canada Agriculture, Research Station, P. O. Box 457, St. Jean, Quebec J3B 6Z8, Canada (514-346-4494) (2) CND

Ryugo, K., Department of Pomology, University of California, Davis, California 95616. (916-752-0929) (2) USA

Samson, Regine, Station de Phytobacteriologie, Inst. Nat. Recherche Agron., Route de Saint Clement, Beaucouze 49000 Angers, France. (41-87.69.97) (2) FR

Sanchezmonge, E., Departmento Genetica, Estac. Agronomos, Ciudad Universitaria, Madrid 3, Spain. (3) SPN

Sands, D. C., Dept. of Plant Path., Montana State Univ., Bozeman, Montana 59717. (406-994-4832) (2) USA

Scheer, H. A. Th. van der, Research Station for Fruit Growing, Brugstraat 51, 4475 AN Wilhelminadorp, The Netherlands. (01100-16390) (2) NL

Schmidle, A., Biologische Bundesanstalt, Institut fur Pflanzenschutz im Obstbau, Schwabenheimerstrasse, Postfact 73, 6901 Dossenheim/Heidelberg, West Germany. (06221-85238) (3) BRD

Schroder, C., Inst. fur Phytopathologie, Christian-Albrechts Univ., Olshausenstrasse 40-60, 2300 Kiel, West Germany. (0431-880-2996) (1) BRD

Schroth, M. N., Department of Plant Pathology, University of California, Berkeley, California 94720. (415-642-6938) (1) USA

Schulz, F. A., Inst. fur Phytopathologie, Christian-Albrechts Univ., Olshausenstrasse 40-60, 2300 Kiel, West Germany. (0431-880-2996) (1) BRD

Seem, R. C., Department of Plant Pathology, N. Y. State Agric. Expt. Station, P. O. Box 462, Geneva, New York 14456. (315-787-2366) (2) USA

Seemuller, E., Biologische Bundesanstalt, Institut fur Pflanzenschutz im Obstbau, Schwabenheimerstrasse, Postfach 73, 6901 Dossenheim/Heidelberg, West Germany. (06221-85238) (3) BRD

Severin, V., Laboratory of Phytobacteriology, Research Inst. for Plant Protection, Blvd. Ion Ionescu de la Brad 8, Bucharest-Baneasa, Romania. (33.58.58-50) (3) ROM

Simonsen, J., State Experimental Station, Studsgaard, 7400 Herning, Denmark. (07-164111) (2) DK

Slack, D., Dept. of Plant Pathology, Univ. of Arkansas, Fayetteville, Arkansas 72701. (501-575-2446) (1) USA

Sobiczewski, P., Research Institute of Pomology, ul. Pomologiczna 18, 96-100 Skierniewice, Poland. (Skierniewice 34-21) (3) POL

Spotts, B. P., Mid-Columbia Expt. Station, Route 5, Box 240, Hood River, Oregon 97031. (503-386-2030) (1) USA

Stankovic, D., Horticulture Dept., Faculty of Agriculture, Univ. of Belgrade, ul. Namanjina 6, 11080 Zemun (Belgrade), Yugoslavia. (3) YUG

Starr, M. P., Department of Bacteriology, University of California, Davis, California 95616. (916-752-0283) (1) USA

Stushnoff, C., Department of Horticultural Science, Univ. of Minnesota, St. Paul, Minnesota 55101. (612-373-1030) (2) USA

Sutton, T. B., Department of Plant Pathology, N. C. State Univ., Raleigh, North Carolina 27650. (919-737-2752) (2) USA

Szkolnik, M., Department of Plant Pathology, N. Y. State Agr. Exp. Station, Geneva, New York 14456. (315-787-2375) (1) USA

Teissier, R., Service de la Protection des Vegetaux, 231 rue de la Convention, 75015 Paris, France. (532-21-29) (3) FR

Thibault, B., Station de Recherches d'Arboriculture Fruitiere, Inst. Nat. Recherche Agron., Route de Saint Clement, Beaucouze 49000 Angers, France. (41-48.51.23) (1) FR

Thompson, J. M., U. S. Dept. Agriculture, Southeastern Fruit & Tree Nut Research Station, P. O. Box 87, Byron, Georgia 31008. (912-238-0422) (1) USA

Thomson, S. V., Department of Biology, Utah State University, Logan, Utah 84322. (801-752-4100 ext. 8440) (1) USA

Valyi, S., Department of Plant Protect. and Agrochemistry, Ministry of Agriculture and Food Admin., Kossuth Lajos ter 11, Budapest, Hungary. (3) HUN

Veldeman, R., Government Research Station for Phytopathology, 96 Burg. van Gransberghelaan, 9220 Merelbeke, Belgium. (091-522083) (2) BLG

Vogelsanger, D., Pflanzenschutzamt, Hermannswerder 20A, 15 Potsdam, East Germany. (3) DDR

Vondracek, J., Fruit Research Station, Techobuzize, 411 42 Ploskovice (okr. Litomerice), Czechoslovakia. (Ploskovice 9387) (3) CZE

Vukovits, G., Bundesanstalt fur Pflanzenschutz, Vienna, Austria (3) OST

Wade, E. K., Department of Plant Pathology, University of Wisconsin, Madison, Wisconsin 53706. (608-262-1426) (2) USA

Walsh, P., Dept. of Agriculture, Agriculture House, Kildare St., Dublin 2, Ireland. (789011 ext. 3289) (3) IRL

Way, R. D., Department of Pomology & Viticulture, N. Y. State Agric. Expt. Station, Geneva, New York 14456. (315-787-2235) (1) USA

Weaver, L. O., Department of Botany, University of Maryland, College Park, Maryland 20742. (301-454-3816) (2) USA

Westwood, M. N., Department of Horticulture, Oregon State University, Corvallis, Oregon 97331. (503-754-3695) (2) USA

Wiggel, D., Ministry of Agriculture, Olantigh Road, Wyl, Nr. Ashford, Kent, England. (2) UK

Williams, E. B., Department of Botany & Plant Pathology, Purdue University, Lafayette, Indiana 47907. (317-749-6423) (2) USA

Wimalajeewa, S., Plant Research Institute, Burnley Gardens, Swan Street, Burnley, Victoria, Australia, 3121. (8101511) (3) AUS

Yoder, K. S., Fruit Research Laboratory, Va. Polytech, Inst., 2500 Valley Ave., Winchester, Virginia 22601. (703-667-8330) (1) USA

Yorston, Y. M., Brit. Columb. Ministry of Agric., Research Station, Summerland, British Columbia V0H 1Z0 Canada (604-494-7011) (2) CND

Zehr, E. I., Department of Plant Pathology & Physiol., Clemson University, Clemson, South Carolina 29631. (803-656-3450) (2) USA

Zeller, W., Biologische Bundesanstalt fur Land und Forstwirtschaft, Institut fur Pflanzenschutz in Ackerbau und Grunland, Schlosskoppelweg 8, 2305 Heikendorf-Kitzeberg (Kiel), West Germany. (0431-23495) (1) BRD

Zoller, B. G., Agricultural Advisors, Inc., P. O. Box 952, Yuba City, California 95991. (916-674-1255) (2) USA

Zwet, T. van der, U. S. Department of Agriculture, Fruit Lab., Room 12, Building 004, Agric. Research Center, West, Beltsville, Maryland 20705. (301-344-3575) (1) USA

SUMMARY

Persons Interested in Fire Blight

Country	Interest Category 1	2	3	4	Total	Number of Contact Persons
USA - United States	32	48		4	84	15
CND - Canada	3	11			14	3
BRD - West Germany	9		5		14	1
NL - Netherlands	5	3			8	1
DK - Denmark	3	4			7	1
FR - France	2	1	3		6	1
UK - England	2	4			6	1
ITA - Italy			5		5	1
SPN - Spain			4		4	1
SWT - Switzerland			4		4	1
BLG - Belgium	1	2			3	1
CZE - Czechoslovakia			3		3	1
DDR - East Germany			3		3	1
SWD - Sweden			3		3	1
AUS - Australia			2		2	
GRC - Greece			2		2	1
HUN - Hungary			2		2	1
JAP - Japan			2		2	
NOR - Norway			2		2	1
ROM - Romania			2		2	1
SA - South Africa		1	1		2	
YUG - Yugoslavia			2		2	1
ARG - Argentina			1		1	1
BRA - Brazil			1		1	
IND - India			1		1	
IRL - Ireland			1		1	1
MEX - Mexico		1			1	
NZ - New Zealand		1			1	1
OST - Austria			1	1		
POL - Poland			1		1	1
POR - Portugal			1		1	
TUR - Turkey			1		1	
TOTAL	57	76	53	4	190	39

SUMMARY

Contact Persons for Fire Blight Newsletter

United States & Canada

Arkansas	Slack, D.
California	Moller, W. J.
Colorado	Luepschen, N. S.
Delaware	Davidson, S. H.
Georgia	Thompson, J. M.
Illinois	Ries, S. M.
Maryland	van der Zwet, T.
Michigan	Klos, E. J.
Missouri	Goodman, R. N.
New Jersey	Preiser, F.
New York	Beer, S. V.
North Carolina	Drake, C. R.
Oregon	Lombard, P. B.
Pennsylvania	Hickey, K. D.
Washington	Covey, R. P.

Canada

British Columbia	McPhee, R.
Nova Scotia	Ross, R. G.
Ontario	Bonn, W. G.

Other Countries

Argentina	Meyer, F. C.
Belgium	Porreye, W.
Czechoslovakia	Vondracek, J.
Denmark	Hockenhull, J.
England	Billing, E.
France	Paulin, J. P.
Germany (East)	Kleinhempel, H.
Germany (West)	Zeller, W.
Greece	Psallidas, P. G.
Hungary	Klement, Z.
Ireland	Walsh, P.
Italy	Bazzi, C.
Netherlands	Maas Geesteranus, H. P.
New Zealand	Dye, D. W.
Norway	Roed, H.
Poland	Sobiczewski, P.
Romania	Severin, V.
Spain	Noval Alonso, C.
Sweden	Olsson, K. M.
Switzerland	Grimm, R.
Yugoslavia	Arsenijevic, M.

Fire Blight Mailing List Questionnaire

The list of names in this Newsletter is the first attempt to establish a complete and updated mailing list of all persons interested in fire blight. Please make corrections and additions where necessary and send me any new names not listed. A new list will be prepared for the second newsletter next winter.

☐ My name, address and telephone are correct (if not, show change below)

☐ My interest in fire blight is correct (if not, please indicate below)

☐ My name should be dropped from this list

☐ My/other name should be added to this list

NAME _____

ADDRESS _____

_____

_____ Zip

TELEPHONE _____

Interest in fire blight research: 1 2 3 4

Interest in fire blight newsletter: YES NO

I will serve as contact person for newsletter questionnaire: YES NO

} Please circle one of each

_____

Please return to your contact person or directly to:

T. van der Zwet, USDA, Fruit Laboratory
Room 12, Building 004, BARC-West
Beltsville, Maryland 20705

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SURVEY OF FIRE BLIGHT RESEARCH IN THE UNITED STATES, CANADA AND EUROPE

(November 1979)

Country/State	Investigator	Discipline	Full-time effort percent	Support personnel number	Source of support	Objectives

Please return to your contact person or directly to:

T. van der Zwet, USDA, Fruit Laboratory
Room 12, Building 004, BARC-West
Beltsville, Maryland 20705